

XML for the recovery of the Law in force

Javier de Andrés Rivero
Faculty of Computer Sciences
University of Murcia
Spain
34 968367938
jandres@dif.um.es

Juan José Iniesta Delgado
Faculty of Law
University of Murcia
Spain
34 968364370
jiniesta@um.es

Antonio F. Gómez Skarmeta
Faculty of Computer Sciences
University of Murcia
Spain
34 968364607
skarmeta@dif.um.es

ABSTRACT

This paper presents our work on the development of a computer system of legal document management which allows the automatic recovery of the Law in force. In this paper we showed the different related projects that they exists in other counties, the benefits to use XML to mark legal documents and for its later recovery, and we showed the architecture used for the accomplishment of the project.

Categories and Subject Descriptors

H3.3 [Information Systems]: Information Search and Retrieval - Retrieval models, Search process

General Terms

Standardization, Legal Aspects and experimentation.

Keywords

XML, Recovery, Law, in force, Computer.

1. INTRODUCTION

What we have aimed is the creation of a computer system of legal text management, with views to the creation of a consolidated database that allows the automatic recovery of the effective right.

This computer system could be used in the normative creation processes by the different entities with competition in the scope of the production of law.

It is an applicable system to any sector of the legal ordering, proceedings to the normalization of already existing legal texts in views to its incorporation to the database that allows to recover at a certain moment the effective right.

In summary, the goal is to create a tool able to find the relevant information for each one who takes an interest in a certain field. At this time, that field is a national legal system.

In line with this objective, we have chosen to organize and prepare legal text for its incorporation into the database. With this point of view we use XML technology to obtain a uniform set of data connected.

We can relate parts of a legal text with outstanding information by XML. This application should, on the one hand, expedite different types of search, and on the other, provide the interaction between parts of a same legal text or different legal texts incorporated into the same database. This latter must be emphasized because the organization of normative material depends on the relationship between the sentences included in legal texts.

We think that the relations between the components of legal texts are specially interesting because they cause the modification of those same components and so, a constant change in the relevant legal information. The search of the legal information is not carried out with respect to a set systematized and static of data, but with respect to a data set that is modified with the introduction of new data.

Considered the legal system at different moments (days), we can observe that its content is also different. In fact, in a certain day there would be new legal texts (laws) that the previous day were not; also, legal texts including in legal system at the previous day, would not be at the following day. The content of a same legal text including into legal system in different days also can change, because some of their sentences have been derogated or substituted by new sentences.

The applications created in this project try to reflect that dynamic reality of the legal system to improve the search of relevant information at every moment for which it is interested. *I. e.*, it must allow the search of the sentences that they are Law at the day of the search or at any other previous day asked for by the interested person.

In order to obtain this result it is necessary to specify how the operations of normative modification are made (derogation, incorporation and substitution), so that the system can recognize when these modifications take place and what texts are affected.

We try to obtain an application that allows operating automatically the normative changes considering the information provided by the same documents that integrate the data base.

It is necessary to consider that the changes undergone by legal norms are not reflected in the creation of any real text. For that reason, the updated version of legal texts is due to offer through the elaboration of a “virtual” legal text. The program generates this “virtual” text by using the standards that the interpreter apply to apply the modifying operations indicated by the modifying norm.

Working on preceding initiatives, it is specially interested to emphasize the temporary aspects of the normative modifications and to assure that the program responds to the theoretical treatment of those temporary aspects.

The automated management of the normative modifications will only give acceptable results if it works according to the temporary standards that govern the production of such modifications. That is to say, the program not only must recognize that a certain legal norm has been derogated or incorporated, but also must show these effects at the appropriate moment. This way, the search of a legal text in any day previous to the production of the effect must offer like result the legal text not yet modified; however, a search of a legal text in the day of production of the effect or another later day must show the modified text.

In order to obtain this objective we must specify the standards used to indicate the day in that a text begins to be including in the legal system, as well as the day in which it leaves it. The text, this way, will be a legal norm in the interval between those days. The standards that have been used in the development of our program are taken from the analysis made by Hernandez Marín on the interval of validity of the legal norms¹. Indeed, by interval of validity it is understood that time in which a text belongs to the legal system.

In accordance with these standards the temporary limits of the interval of validity of a legal statement are in the day of the publication (initial limit) and the day of the derogation (final limit). Therefore, the time in which a text belongs to the Law is framed by the day of its publication (including) and the day of its derogation (not including).

To determine the day of the publication does not represent a problem normally, since it comes identified with the date of the official gazette in which the text is published. The greater difficulties arise from determine the day of the derogation.

Since the application works only with text modifications, it's not necessary to analyze the difficulty that tacit derogation or material express derogation causes. We will only specify a standard that serves to determine the day of the formal express derogation. That is to say, that derogation produced by a formal derogating norm. These standards are:

- The day of the derogation for any norm is indicated by the time of effects in the derogating norm that refer to derogated norm.
- The time of effects in the derogating norm is the day for the production of this effect indicated in the same

derogating norm. If the derogating norm does not contain indications on its time of effects (as usually it happens), its time of effects will coincide with the date of come into force of the legal text to which the derogating norm belongs.

- The derogation only has effects on norm that have not been previously derogated. Therefore, the derogated text still must be a legal norm the day before the time of effects of the derogating norm. Otherwise, the day of the derogation of that legal norm will be a previous day, corresponding to the time of effects of a different derogating norm.
- The derogating norm is a legal norm (belong to the legal system) at the day of the derogation. If the derogation norm already has been derogated, it will not be able to produce its own effect. This way, the program will not consider the derogation of a legal norm if it verifies that the derogating norm also has been derogated at any day before its time of effects.
- The derogating norm has equal or higher hierarchical rank than the derogated legal norm.

2. PROJECTS OF SIMILAR INITIATIVE

Since it has been indicated, this project has precedents in related projects that are studying in diverse countries.

Emphasizing among them:

- Lex<data [10].

Its primary objective is the free legal document interchange everywhere, persecuting the standardization of documents using " RDF Legal Dictionaries" and applying them to the creation of schemes XML. The organization doesn't take charge of creating tools for the information interchange, but that it only takes care of the creation of standards.

- LEXML [8]

Its objective is to make (in coordinated form) standards based on XML to structure legal documents.

LEXML serves as forum of legal dominion for the ideas interchange and experiences associated with XML. It also serves as linking point to coordinate the development of

¹ HERNANDEZ MARÍN, R., *Introducción a la teoría de la norma jurídica*, Marcial Pons, Madrid-Barcelona 2002, pp. 442 y ss.

standardized structures, vocabularies and data interchange tools.

It bets on the development of a global data modelling for legal documents, made in XML.

- OASIS & LegalXML [6]

The organization joins legal experts with computer science technicians to create standards for the legal documentation interchange in electronic format. LegalXML does not try to create a standard that includes all the possible types of legal documents that exist nowadays. What looks for at first is to elaborate a base from which to define the most used elements in a certain legal document sector.

- MetaLex [1].

Open standard XML for the legal document marked one of the Dutch legislation, developed by the University of Amsterdam. It is the first standard that gives importance to the dates of the legal document to determine its validity, for it four types of dates are used: promulgation, cancellation, publication and effectiveness.

- Norma project [4].

It is an Italian project that incorporates the necessary components for the management of all the productive cycle of a legal document, and that uses language XML for the marked one of documents.

One of the greatest advantages of the Norma project it is that the DTD that is used has been approved by the Italian government, although it does not use exclusively a single DTD, but it uses several, (base, flexible and complete) to represent legal documents. Each one of these DTD makes document XML to be more restrictive than the other one [9].

3. XML'S BENEFITS TO MARK LEGAL DOCUMENTS

The advantages that XML offers for the marked one and exchange of information are very well known.

Among the advantages of XML for the legal document marked one it is possible to emphasize:

- **To add the metadata:** The main benefit of XML, for the legal document marked one, is that it keeps by the text that represents the legal document, the necessary metadata to give mean that text, therefore the computer can process this document.

For example, if the computer receives the following text:

Artículo 4. Empleo de la firma electrónica en el ámbito de las Administraciones públicas.

1. Esta Ley se aplicará al uso de la firma electrónica en el seno de las Administraciones públicas, sus organismos públicos y las entidades dependientes o vinculadas a las mismas y en las

relaciones que mantengan aquéllas y éstos entre sí o con los particulares.

Las Administraciones públicas, con el objeto de salvaguardar las garantías de cada procedimiento, podrán establecer condiciones adicionales a la utilización de la firma electrónica en los procedimientos. Dichas condiciones podrán incluir, entre otras, la imposición de fechas electrónicas sobre los documentos electrónicos integrados en un expediente administrativo. Se entiende por fecha electrónica el conjunto de datos en forma electrónica utilizados como medio para constatar el momento en que se ha efectuado una actuación sobre otros datos electrónicos a los que están asociados.

2. Las condiciones adicionales a las que se refiere el apartado anterior sólo podrán hacer referencia a las características específicas de la aplicación de que se trate y deberán garantizar el cumplimiento de lo previsto en el [artículo 45 de la Ley 30/1992, de 26 de noviembre, de Régimen Jurídico de las Administraciones Públicas y del Procedimiento Administrativo Común](#). Estas condiciones serán objetivas, proporcionadas, transparentes y no discriminatorias y no deberán obstaculizar la prestación de servicios de certificación al ciudadano cuando intervengan distintas Administraciones públicas nacionales o del Espacio Económico Europeo.

The computer only could process it like text without no meaning, but if it arrived to him:

```
<Articulo id="4">
<Tit>Artículo 4. Empleo de la firma electrónica en el ámbito de
las Administraciones públicas.</Tit>
<CuerpoArticulo>
<Apartado id="4.1">
<Tit>1.</Tit>
<CuerpoApartado>
<Enunciado id="4.1.1">
<Cuerpo>
Esta Ley se aplicará al uso de la firma electrónica
en el seno de las Administraciones públicas, sus
organismos públicos y las entidades dependientes o
vinculadas a las mismas y en las relaciones que
mantengan aquéllas y éstos entre sí o con los
particulares.
</Cuerpo>
</Enunciado>
<Enunciado id="4.1.2">
<Cuerpo>
Las Administraciones públicas, con el objeto de
salvaguardar las garantías de cada procedimiento,
podrán establecer condiciones adicionales a la
utilización de la firma electrónica en los
procedimientos.
</Cuerpo>
</Enunciado>
<Enunciado id="4.1.3">
<Cuerpo>
Dichas condiciones podrán incluir, entre otras, la
```

imposición de fechas electrónicas sobre los documentos electrónicos integrados en un expediente administrativo. Se entiende por fecha electrónica el conjunto de datos en forma electrónica utilizados como medio para constatar el momento en que se ha efectuado una actuación sobre otros datos electrónicos a los que están asociados.

```

</Cuerpo>
</Enunciado>
</CuerpoApartado>
</Apartado>
<Apartado id="4.2">
<Tit>2.</Tit>
<CuerpoApartado>
<Enunciado id="4.2.1">
<Cuerpo>

```

Las condiciones adicionales a las que se refiere el apartado anterior sólo podrán hacer referencia a las características específicas de la aplicación de que se trate y deberán garantizar el cumplimiento de lo previsto en el [<Enlace xlink:type="simple" xlink:href="urn:um:LEY30/1992@45" tipo="Original">](urn:um:LEY30/1992@45) artículo 45 de la Ley 30/1992, de 26 de noviembre, de Régimen Jurídico de las Administraciones Públicas y del Procedimiento Administrativo Común</Enlace>.

```

</Cuerpo>
</Enunciado>
<Enunciado id="4.2.2">
<Cuerpo>

```

Estas condiciones serán objetivas, proporcionadas, transparentes y no discriminatorias y no deberán obstaculizar la prestación de servicios de certificación al ciudadano cuando intervengan distintas Administraciones públicas nacionales o del Espacio Económico Europeo.

```

</Cuerpo>
</Enunciado>
</CuerpoApartado>
</Apartado>
</CuerpoArticulo>
</Articulo>

```

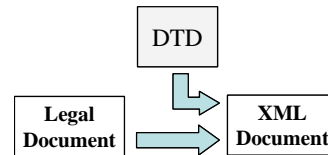
Now, by the text that represents the article is all the necessary metadata for its processing. For example it can still differentiate the sections, the statements etc...

- **The documents can be of any size and with diverse means integration:** The electronic documents in the legal scope are characterized by the diverse means inclusion, like text, tables, graphs or drawings. Moreover XML can also incorporate videos or sounds in case we want to include them in a future.

- **Hypertextual capacity:** It allows to integrate the connections of the references in the own text, both the internal ones to the document and the external ones to other documents. This capacity is extremely important by the explicit relations that a legal text has.
- **Diversity of supports and means of diffusion for a same data base:** Without having to establish any modification, the hypertextual document set can be spread through Internet by means of a Web server, either in a physical format as a CD-ROM or other supports .
- **Search facility:** It is possible to integrate easily a motor search that it allows to make functions of precise searches and "semantic" searches functions understanding by "semantic" searches by the meaning of the content of the legal document. This is possible since with XML we have all the necessary metadata that it describes the semantics of the legal document together with the own text of the document.

4. EXPERIMENTS AND REALIZED ARCHITECTURE

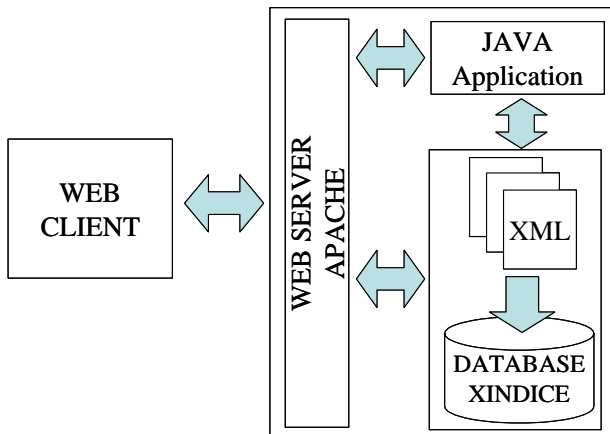
For the problem proposed to us, first it was designed it was the DTD² that the documents XML, that represent legal documents, have to comply.



We have created it the sufficiently flexible to be able to represent all the types of legal documents that exist in the Spanish legislation.

The made architecture has the following aspect

² D.T.D. Document Type Definition defines the document structure with a list of legal elements.



This is made up of the following modules:

o Module of consolidation of the right.

It is the one in charge of recovering the state of a legal document in a certain date.

The module processes the document XML (that represents the legal document to show) and at the same time it creates a new document XML with the state of the legal document at that date.

Its operation is that it processes the metadata of the document, then it verifies if there have been modifications of the legal document from the date of publication to date that we want to look for. If there have been modifications it keeps them in a structure for his later treatment.

Then it processes, one by one, the articles, that compose the legal document, verifying which of them undergo some modification.

If the articles have undergone some modification it deals with them according to this type:

- If it is a "Substitution":
It recovers of the modifier norm the new text, and then saves in document XML the article with the changed content.
- If it is a "Derogation":
In the new document, the title of the article is only kept together with the attributes that indicate that it has been countermanded, when and who.
- If it is a "Cancellation":
A cancellation works just as a derogation, that is in the new document the title of the article is only included together with attributes that indicate that it has been cancelled, when and the order that has cancelled it.

If it has not undergone any modification it is kept like that in new document XML.

At the end of the process we have got a new document XML with the changes that other legal documents (or judicial orders) have made to him.

This new XML document is "a virtual" document, i.e., versions of documents are not created as some of the European projects do (as it happens in the "Norma Project" of Italy [3]).

The benefit to use versions is that they would allow one more a faster extraction because it would only be necessary to accede to the version that it has kept from the norm at the date that is being looked for. On the contrary, they have many disadvantages, to emphasize that if in the process of insertion of a group of norms we forgot to introduce a modification, it would be necessary to alter XML documents from all the latest versions. When this happens in the "Norma Project" these changes are made by hand by Computer science that know the structure very well.

This new document changes using XSLT³ to show it in the Web.

o Module of XML database.

It is the module that is in charge of keeping, in a collection, all the XML documents that represent the legal norms.

A very important aspect is the use of a native XML database [2], mainly for two reasons:

1. It is not needed to transform document XML to some structure of data makes specific to keep it in a relational database.
2. All the relational databases are centered on the data, data-centric databases, because what they store in his fields are atomic data, whereas a native XML database, neither has got fields, nor stores atomic data, but what it stores are complete documents XML.

An important aspect that these databases have is that they do not use SQL⁴ as query language, instead of it use XPATH⁵ to select and to index the text, elements, attributes and any other information contained within a XML document.

We have used the database manager XINDICE⁶ from APACHE by its facility of connection with a Web server (Tomcat of apache) and because it is free software.

o Edition module of the legal documents.

This module is made up of an application to transform a legal norm to a XML document with the structure that it

³ XSLT. is a language for transforming XML documents into other XML documents. <http://www.w3.org/TR/xslt>

⁴ SQL. Structured Query Language is an ANSI (American National Standards Institute) standard computer language for accessing and manipulating database systems. SQL statements are used to retrieve and update data in a database.

⁵ XPATH. XML Path Language is a set of syntax rules for defining parts of an XML document. <http://www.w3.org/TR/xpath>

⁶ Xindice of Apache. <http://xml.apache.org/xindice/>

needs, so that once it is in the wished structure, is kept in the database (together with the other norms).

- Module search of the legal documents

This module allows making searches on the norms included in the database, according to different criteria.

It is possible to look for according to different criteria, being the most important searches by the dates of approval of publication or take effect. Several criteria can be mixed to make the search most precise.

- WEB module for the uniform access to the information

Module that is in charge of showing everything through a Web client, i.e., of making that booth the application for the edition of legal bodies, and the seeker and the application for the recovery of the state of a norm in a certain date are accessible through Web.

As we have said, has been used as Web server Tomcat⁷ (of Apache), which is, a gratuitous Web server and that it works in different platforms.

5. CONCLUSIONS AND FUTURE WORK

With this project the work of a user is facilitated when he needs to recover the state of a norm at a concrete date, since it is acceded automatically to all the norms that modify a concrete one, and thus he doesn't have to make it manually.

Of this form the user saves a concerted effort and a great amount of hours, avoiding in addition the possible failures that could be caused if the jurist did it by hand and he did not consider a norm that modified he wanted to consult to, for example, if he did not remember consulting a law that countermanded an article of the norm that he wants to consult and he gives that article as valid.

The applications created in this project do not try to be more than one first version which we will be improving for its better operation.

For future works we plan to integrate the elaborated applications in the context of a more complete program to facilitate the relevant information search. In fact, the main utility of the determination of the version in force of a legal text is in the search of the norm applicable in certain case.

This type of search is special because the required information is integrated by norms that are relevant by their applicability to a certain situation (for example, we want to look for the norms applicable to a renting contract).

The exposition and the resolution of a legal problem — that is to say, a problem whose solution requires a decision based on Law — require the selection of the norm that refer to a certain case assigning a specific legal effect to him. The identification of the applicable norm is an essential operation in the procedure of application of Law. Like it has been indicated often, this is a complex operation because the terms required for search what we needed —the applicable norm— within the scope of reference — the legal system— are obtained through the observation of the relevant characteristics of the specific problem.

This way, we must consider the legal type of the raised situation (for example, if it is a contract, transaction, renting...; if it is a crime, homicide, robbery, swindle...). Also it will be necessary to consider the condition of the subjects that take part (for example, if they are retailers, if they are civil employees, etc.). The connexion between the events, or their participants and a territory (resolution of international conflicts of norms).

All these circumstances are important in the search of the applicable norm. But, we want now emphasize the importance of the date in which the determining events of the problem take place and also the importance of the date in which the norms are applied to obtain the legal solution of the problem.

The jurists normally give a special relevance to the date in which the determining events of the problem have taken place when they want to look for the norm that is to be applied in that situation. This relevance comes from the belief, extended enough, according to which the Law applicable to a case is the Law in force when that case took place.

Nevertheless, this belief is in contradiction with an affirmation that corresponds far better with the reality of the legal practice. That is to say, the Law that is relevant for the resolution of a legal problem is the Law of the day in which it is to solve that legal problem. This way, if the Law that regulated a case when this it took place has been modified later, the relevant Law will be now integrated by the new norms that refer to that case.

However, we also consider that those norms sometimes forward to norms or versions of previously norms in force. Usually it happens this way when there is a normative change and cases happened before this change need solution (transitory law). Perhaps the belief before mentioned arises from that circumstance, since in those cases the norm that is used to solve the problem is a norm that no longer belongs to Law, but that belonged to Law when the problem was generated.

But, in any case, we must notice that this norm —that no longer it is a legal norm— is not applied directly, but that is applied because of the remission made by the new norm. Moreover it is necessary to consider that not always is used the technique of the remission to the previous Law, but in many occasions the dispositions of transitory Law establish a specific material regulation that is directly applicable to the previous cases.

In summary, to elaborate the program to facilitate the applicable legal norm search it is necessary to consider the previously indicated one, according to which the program must operate with the following criteria:

- First, the date when the solution of the case is requested, selecting only the norms that are legal in that date.

⁷ Apache Tomcat from “*The Apache Jakarta Project*”
<http://jakarta.apache.org/tomcat/>

- Secondly, the date when the problem has been generated, that is one of the factors (the matter, the subjects or the territory are relevant too) that will allow to discriminate which of those legal norms are applicable to the case.

If, according to this last date, the applicable norm is a disposition of transitory Law that forward to other norms that already have been derogated, the program must be able to find the version of that derogated norm in the indicated date. For that reason it is important to have available the diverse versions of a norm after its successive modifications.

In any case, this we must take care of very aspects in the creation of the program search that we try to develop; the previously mentioned one is only one of them —very important, without a doubt—. There are many other aspects that we have to consider, such as the specification of the subsumption intervals of each norm, or the elaboration of a catalogue of legal matters that allows establishing automatic correspondences between the concrete cases and the applicable norms, etc.

6. REFERENCES

- [1] Alexander Boer, Rinke Hoekstra and Radboud Winkels, “METALex: Legislation in XML.” Proceedings of the Fifteenth Annual International Conference of Legal Knowledge and Information Systems (2002).
- [2] Ronald Bourret. XML and Databases. A discussion of the relationship between XML and databases. Includes a discussion of native XML databases. <http://www.rpbouret.com/xml/XMLAndDatabases.htm>
- [3] Monica Palminari, “Norma Project”, Jornadas sobre técnicas informáticas para la actualización automática del Derecho. Octubre 2004, Murcia.
- [4] C. Biagioli, E. Francesconi, P. Spinosa, M. Taddei, “The NIR Project: Standards and Tools for Legislative Drafting and Legal Document Web Publication.”, ICAIL 2003
- [5] Marie-Francine Moens “XML Retrieval Models for Legislation”, Berlín Jurix 2004.
- [6] Harm jan van Burg of OASIS, “Xml-standards in taxes” <http://www.lri.jur.uva.nl/standards2003/OasisMetalexConfUtrechtDecember2003.pdf>
- [7] Hugh Tucker, GIAXS 2003, “Developing XML Schemas for Danish Law Text” http://www.oio.dk/files/Full_-_ver_1.0_2003_08.doc
- [8] Murk Muller, XML Europe 2002. “Legal RDF Dictionary” http://www.idealliance.org/papers/xmle02/dx_xmle02/papers/03-04-03/03-04-03.html
- [9] C. Biagioli, E. Francesconi, P. Spinosa, M. Taddei, ICAIL 2003, “The NIR Project: Standards and Tools for Legislative Drafting and Legal Document Web Publication.”,
- [10] Lex<>data “FREE FLOW OF LEGAL DATA WORLD WIDE” <http://www.lexdata.org/>